SD11
.A1
A42
no.77

SUBALPINE FIR

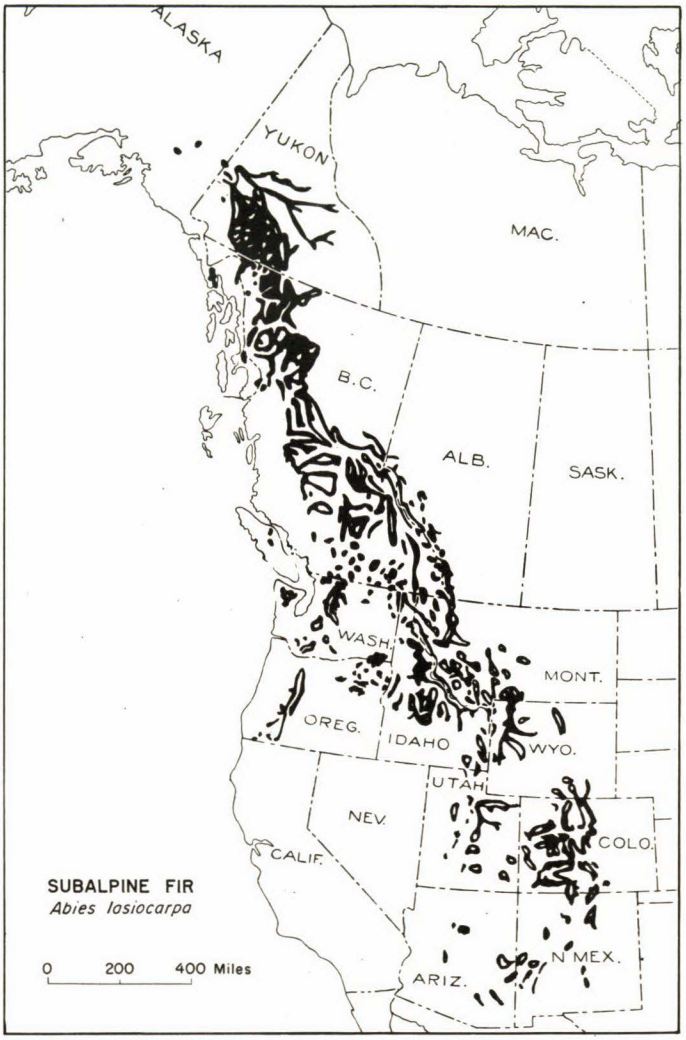
(Abies lasiocarpa)

F–439081

This fir is a native of the Rocky Mountains.

SUBALPINE FIR
(Abies lasiocarpa)

SUBALPINE FIR, also called balsam fir, Rocky Mountain fir, and white fir, in one of the lesser known of the western conifers. It was probably discovered by Lewis and Clark when they were crossing the Bitterroot Mountains in 1805, for the narrative of that expedition mentions "a growth of eight different species of pine." As it was common in those days for even botanists to designate as "pine" the trees now known as firs, by elimination the eight species must have included this fir. David Douglas, that intrepid botanist of the Northwest, was the first to collect a specimen of the species, in 1832.



F–392368

Subalpine fir is distributed from Alaska almost to Mexico.

As its name implies, subalpine fir is naturally a timberline tree. It grows in cold, moist situations at altitudes of about sea level in the northern part of its range to about 12,000 feet in the southern part and is commonly found at timberline, as well as in protected valleys at the heads of mountain streams, about high mountain lakes, and in moist subalpine meadows. The most widely distributed North American fir, its range extends from the mountains of southern Arizona and New Mexico to southern Yukon and southeastern Alaska. It has not been found in California or Nevada.

Subalpine fir grows in small pure stands, as well as in mixture with other trees. In the northern part of its range it mingles more or less with mountain hemlock, Engelmann spruce, lodgepole pine, whitebark pine, limber pine, and subalpine larch. Engelmann spruce, lodgepole pine, aspen, and sometimes bristle cone pine are its southern associates. The variety corkbark fir occurs from central Colorado to northern and eastern Arizona and southwestern New Mexico.

Trees of this species are conspicuous by their long, narrowly conical crowns ending in spearlike points, which make them easy to distinguish from their associated species. In the open, the narrow crowns of both old and young trees usually extend down to the ground.

This fact, combined with the usually thin bark and resinous character of the tree, makes it extremely susceptible to both ground and crown fires. In very close stands, however, old trees may be found with trunks free of branches for 20 to 40 feet or more.

With the possible exception of the relatively rare bristlecone fir of California, this is the smallest of the western firs, ordinarily attaining a height of 60 to 90 feet and a diameter of 14 to 24 inches. Old trees sometimes reach heights of 100 or 130 feet, and very rarely 160 feet, with diameters of 3 to 4 feet. In exposed high situations the trunk may be under 4 feet in height, with very long lower branches resting on the ground. Subalpine fir is moderately long lived. Trees from 10 to 20 inches in diameter are from 140 to 210 years old, although considerably larger trees may not have lived more than 250 years.

The foliage of subalpine fir is deep blue green, the new growth of each season having a silvery tinge. The flat leaves or needles are blunt on the lower branches and somewhat longer than the more pointed needles of the upper branches. The needles are distinctly massed and pointed upward on the branches. The flowers occur above the middle of the tree. The staminate flowers are indigo blue which later turn to violet. The scaly pistillate flowers are dark violet purple. Mature cones are from 2-¼ to about 4 inches in length. When ripe they are a deep purple which gradually becomes lighter by the time the scales fall. The cones stand erect on the upper branches, and during warm weather frequently drip with silvery resin. The ivory-brown seeds have large shiny, purplish, or violet-tinged wings.

The bark of typical subalpine fir is smooth and but little broken, even in

F–308965

The needles of this fir are flat and mostly blunt.

F–308966

The cones stand erect on the upper branches and drip with resin.

F–308965

The smooth bark has blisterlike resin pockets.

fairly large trees where shallow cracks occasionally occur near the base. It is hard, flinty, and ashy gray or chalky white, except for the pale brown of the shallow seams on old trees. As in all balsam firs, the bark of this species is marked by blisterlike resin pockets. The variety corkbark fir has thick, soft, light bark which has been locally used as a cork substitute.

The wood of this fir varies from a pale straw color to light yellowish brown. It is soft, light in weight, fairly straight grained, and splits and works easily. Although subalpine fir rots rapidly in contact with the soil, the well-seasoned shafts of this tree that so frequently remain after forest fires may be sound above the ground for many years.

Subalpine fir is of slight commercial importance. It usually grows at high inaccessible locations, and because of its habit of retaining its lower limbs to the ground for most of its life, produces little clear lumber. The small amount that gets to market is mixed with wood from various other western firs and together with it is known as "white fir." Green timber is occasionally sawed into rough lumber, and dead trees are much used for fuel, house logs, and corral poles.

Subalpine fir is attacked by several species of insects. The hemlock looper, the spruce budworm, and the black-headed budworm eat its needles and defoliate it during outbreaks. At times the bark beetle *Dryocoetes confusus* may be very destructive. The balsam woolly aphid may kill trees where it occurs in the Pacific Northwest.

Diseases of the roots, stems, or leaves are sometimes observed on subalpine fir, but these diseases have not been destructive over large areas and are not important in the normal life of the tree.

Growing on steep slopes at high elevations where few other trees can live, subalpine fir is primarily valuable for protective purposes, such as holding back heavy rainfall and preventing erosion. In the Rocky Mountains this fir forms parts of forests that protect the headwaters of many streams vital to the welfare of the Western states, and so may perform a service more necessary to the Nation than the production of wood.

U.S.DEPARTMENT OF AGRICULTURE
Forest Service

Washington, D.C. 20250 **Slightly Revised July 1969**